01

ΔABC, AB = BC = 29 cm and AC = 42 cm. What is the area of ΔABC ?

$$S = \frac{a+b+c}{2} = \frac{(29+29+42)}{2}\text{ cm} = 50\text{ cm}$$

$$\Delta = \sqrt{S(s-a)(s-b)(s-c)} = \sqrt{50 \times 21 \times 21 \times 8}$$

$$= 21 \times \sqrt{50 \times 8}$$

$$= 21 \times 20 = 420\text{ cm}_2$$

02

The number N is a two digit numbers.

When 'N' is divided by 9 leaves a remainder 1.

When 'N' is divided by 10 leaves a remainder 3.

What is the remainder when 'N' is divided by 11 ?

73 satisfies the given two conditions

11)73(6
66
7

Remainder '7' is 73 is divided by 11

03

What is the smallest whole number larger than are perimeter of any triangle with the sides of length 5 cm and side of 19 cm.

If 19 cm is considered as greatest side then third side must be 15 cm

[∵ It is a whole number]

∴ Perimeter of the triangle = 19 cm + 5 cm + 15 cm

= 39 cm

∴ The smallest whole number larger than the perimeter of the triangle = 40 cm

04

In triangle ABC, AD is drawn perpendicular to BC. If DC is greater that BD, show that AC is greater than AB.

Const:- Notice a point E on CD such that BD = DE

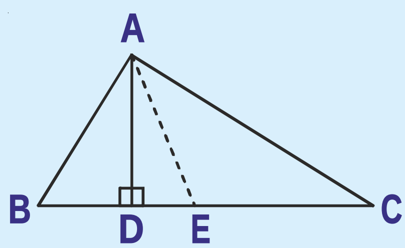
$\Delta ABD \cong AED$ [∵ SAS congruency]

$\Rightarrow \angle B = \angle AED$ .... (1)

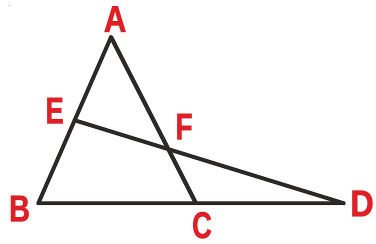
But $\angle AED = \angle C$ .... (2)

from (1) & (2)

$\angle B > \angle C \Rightarrow AC > AB$



05 **In the following diagram, AB = AC. Prove that AF > AE.**



Given in ΔABC, $AB = AC$

$\Rightarrow \angle B = \angle ACB = x$

In ΔCDF, $\angle CFD < \angle ACB$

$\Rightarrow \angle AFE < x$ .... (1)

[$\because$ Exterior angle is greater then each interior opposite angle]

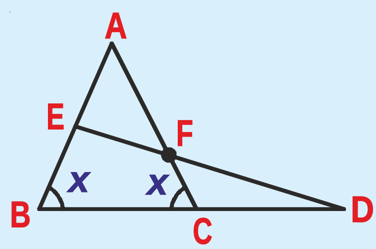
In ΔBDE, $\angle AEF > \angle B$

$\Rightarrow \angle AEF > x$ .... (2)

from (1) & (2)

In ΔAEF

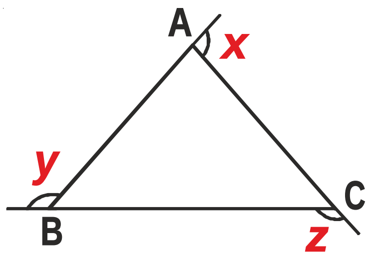
$\angle AEF > \angle AFE \Rightarrow AF > AE$



06 **The following figure shows a triangle ABC with exterior angles as x, y and z.**

(i) If AB > AC > BC; arrange the angles x, y and z in ascending order of their values.

(ii) In the same figure, if $y > x > z$; arrange sides AB, BC and AC in descending order of thier lengths.



(i) Given ΔABC, $AB > AC > BC$

$\Rightarrow \angle ACB > \angle ABC > \angle BAC$

$\Rightarrow -\angle ACB < -\angle ABC < -\angle BAC$

$\Rightarrow 180° - \angle ACB < 180° - \angle ABC < 180° - \angle BAC$

$\Rightarrow z < y < x$

(ii) $y > x > z \Rightarrow -y < -x < -z$

$\Rightarrow 180° - y < 180° - x < 180° - z$

$\Rightarrow \angle ABC < \angle BAC < \angle ACB$

$\Rightarrow AC < BC < AB$

$\Rightarrow AB > BC > AC$